# A Review of the Department of Defense December 31, 1983 Selected Acquisition Report (SAR)

Special Study
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CONGRESS OF THE UNITED STATES CONGRESSIONAL BUDGET OFFICE

# A REVIEW OF THE DEPARTMENT OF DEFENSE DECEMBER 31, 1983 SELECTED ACQUISITION REPORTS (SARs)

Congress of the United States
Congressional Budget Office

## NOTES

Unless otherwise indicated, all years referred to in this report are fiscal years, and all dollar amounts are in current dollars.

Details in the text and tables of this report may not add to totals because of rounding.

## PREFACE

This study presents the results of a Congressional Budget Office (CBO) review of the Department of Defense's Selected Acquisition Reports (SAR) dated December 31, 1983. It provides in a few pages facts and data culled from about 2,000 pages of SAR information. The study is designed to be used by Congressional staff members working in the area of the acquisition of defense weapons systems. It looks at total cost changes in all SAR programs for the fourth quarter of 1983, for the 1983 calendar year as a whole, and over the years since 1977.

This study was requested by the House and Senate Committees on Appropriations and Armed Services. In accordance with CBO's mandate to provide objective and impartial analysis, the paper makes no recommendations. William Myers, Patrick Haar, Jonathan Tyson, Regina Carpel, Julia Doherty, and Michael A. Miller of CBO's Budget Analysis Division prepared the paper under the general supervision of James Blum and C.G. Nuckols. Paul L. Houts and Francis Pierce edited the manuscript. Theresa Kirkland typed the several drafts.

Rudolph G. Penner
Director

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## SUMMARY

The Selected Acquisition Reports (SARs) are quarterly status reports from the Department of Defense (DoD) to the Congress on major defense acquisition programs. They provide one of the most comprehensive sources of data on the costs of defense weapons systems. The SARs present each system program manager's current "best estimate" of key performance, schedule, and cost goals for the total program. For fiscal year 1985, the 96 systems included in the SARs account for about 50 percent of the Administration's overall defense procurement request of $107.6 billion. As a whole, the December 1983 SARs do not present any surprises: projected total costs run only slightly greater than those of a year earlier. Individual SARs continue, however, to provide indications that total program costs could change significantly before the existing projected costs become actual expenditures.

The December 1983 SARs were submitted to the Congress on March 19, 1984. Data in the December 1983 SARs correspond to the President's budget proposal for fiscal year 1985, released on February 1, 1984. Working from that budget, the December SARs extend the cost estimates for each system to the end of the program as it is currently planned. This extension of costs provides a more complete picture of the Administration's defense plans for these systems than does the annual budget.

CBO's study of the December 1983 SARs has three major purposes:

- To examine the magnitude of overall cost changes reported by the SARs;
- To present data for individual systems that demonstrate the effect of recent cost growth on unit costs, measure the reported costs of program stretchouts and the potential savings achievable from efficient production rates, and indicate potential future cost growth; and
- To evaluate the completeness and accuracy of the cost data presented in the SARs.

## ANALYSIS OF OVERALL COST CHANGES IN SAR PROGRAMS

The Congressional Budget Office (CBO) analyzed cost changes reported by the Defense Department for the fourth quarter of 1983, for the 1983 calendar year as a whole, and over the years from 1977 to 1983. Because of limitations in the SAR data, this study can provide only a rough indication of changes in total defense acquisition costs. For example, sums amounting to nearly $23.4 billion are not included in the reported total program costs of 17 systems.

### Cost Changes During the Fourth Quarter of 1983

In the December 1983 SARs, the DoD reported an $11.6 billion (2 percent) net increase in the projected costs of weapons systems for the fourth quarter of 1983. This increase applies only to the 73 systems also included in the September 1983 SARs and represents both actual costs through December 31, 1983, and all planned expenditures through the end of those programs. Lower inflation assumptions used by the Department account for a $13.6 billion cost reduction that is offset by increases in planned quantities of weapons ($17.7 billion), along with higher engineering, estimating, schedule, and support costs ($7.5 billion).

### Annual Cost Changes

To provide a framework in which to gauge recent cost changes and to appraise the impact of DoD management initiatives, CBO calculated annual cost changes since December 1977. This involved adjustments in the data to take account of significant cost elements that are for the most part beyond the control of DoD program managers. Among those elements are the economic (inflation) assumptions used in the cost estimates, and the quantities of each system actually purchased. (This is not intended to imply that all other cost changes are entirely within the control of program managers.) CBO also adjusted the data so that for each pair of consecutive years the same set of weapons systems would be compared in an effort to avoid the distorting effect that adding or deleting systems would have on any analysis.

As shown in Summary Table 1, the annual rate of total program cost change--excluding changes in inflation assumptions and quantity changes--was lower in 1983 than in 1982 measured in both current-year dollars and base-year dollars. This is the lowest rate of change in the six years covered by Summary Table 1, and it lends some support to the Department's claim that cost changes reported in the December 1983 SARs reflect the success of the efforts it has made since 1981 to reduce cost growth.

The results are not conclusive, however, because these are primarily projected rather than actual costs, and because of serious limitations in the data. The SAR data cover only about half of the Administration's 1985 defense procurement request and the December 1983 SARs include only 96 of the more than 112 weapons systems that meet the current criteria for being included in the Department's reports to the Congress and that have not been exempted by the Congress. A further limitation in SAR data is that cost data reported each year may not accurately represent each program's total cost growth. For example, $4.7 billion of MX missile funds authorized prior to 1983 are omitted. This is 22 percent of the reported to-

SUMMARY TABLE 1. ANNUAL RATES OF PROGRAM COST CHANGES FOR MAJOR WEAPONS SYSTEMS SINCE DECEMBER 1977 (In percents)

| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|
| Current-Year Dollars | | | | | | |
| Total Program Cost Change a/ | 7.2 | 6.4 | 18.3 | 36.3 | 3.5 | 4.9 |
| Program Cost Change Excluding Quantity Change b/ | 3.9 | 5.4 | 14.0 | 12.6 | 3.9 | 1.0 |
| Base-Year Dollars c/ | | | | | | |
| Total Program Cost Change a/ | 4.2 | 4.1 | 10.1 | 21.0 | 1.8 | 4.1 |
| Program Cost Change Excluding Quantity Change b/ | 2.3 | 3.4 | 7.6 | 7.7 | 2.5 | 0.8 |

SOURCE: Complied by CBO from December SARs.

a. Excludes economic change--that is, changes in the inflation assumptions used in the cost estimates.

b. Excludes changes in cost resulting from change in quantities procured.

c. The base year varies by program, but generally reflects the year in which a development or production estimate is approved by the Department.

tal program estimate. In addition, there are numerous indications that the latest SAR cost data may not reflect the ultimate acquisition costs. These include recent production-schedule slippages and contract overruns. Similar data limitations have been evident in previous SARs, and they may be expected to occur in future SARs.

## COST GROWTH IN INDIVIDUAL SYSTEMS

In its review of the December SARs, CBO found several indications that, despite the low rate of change in total annual SAR costs, some individual systems continue to show significant cost increases. Among these indicators are breaches of unit-cost thresholds, production rate changes, and contract performance.

### Effects of Production Rates on Costs

Stretchouts increase costs because production levels become less efficient. Higher production rates generally save money by making better use of facilities. CBO's analysis shows that program stretchouts increased estimated costs for 22 SAR systems by about $2.9 billion or 2 percent in the fourth quarter of 1983. Conversely, higher production rates resulted in projected savings of $0.5 billion for five systems. The net cost increase of $2.4 billion is nearly 50 percent less than that reported a year earlier for the same number of systems.

### Unit Costs and the Nunn-McCurdy Amendment

The Nunn-McCurdy Amendment to the 1983 Defense Authorization Act (Public Law 97-252) requires that the Congress be notified when either total program acquisition unit costs or current fiscal year procurement unit costs are more than 15 percent higher than the baseline for a particular program. (The total program cost in the December SAR of the preceeding fiscal year is the baseline.) The Congress uses these thresholds to identify programs with problems early enough to take whatever corrective action is deemed appropriate, such as freezing program funding.

In the December 1983 SARs, three systems exceeded at least one of the unit-cost thresholds by more than 25 percent (see Summary Table 2). Reasons for the increases included a stretchout of planned quantities, program cancellation, and quantity reductions. None of these systems was

SUMMARY TABLE 2. BREACHES OF NUNN-McCURDY AMENDMENT THRESHOLDS (In percent)

| System | 1984 Procurement Unit Cost Above Baseline | Total Program Acquisition Unit Cost Above Baseline |
|---|---|---|
| Army | | |
| Pershing II Missile | 29.4 a/ | -- |
| Light Armored Vehicle | -- | 49.6 |
| Air Force | | |
| Inertial Upper Stage Vehicle | -- | 49.9 |

SOURCE: Compiled by CBO from data provided by the Department of Defense.

a. Unit-cost increase based on the number of missiles procured as compared with the number of battery sets procured. DoD now uses battery sets to measure unit-cost change but plans to use missiles beginning in 1985.

among the 11 systems that exceeded at least one of the thresholds a year earlier.

## Indications of Future Cost Growth

CBO also found indications that costs for some systems will continue to grow. The DoD's 1985 budget revision, dated May 3, 1984, proposes additional program stretchouts for 28 of the 96 systems included in the December 1983 SARs. Revised data, such as yearly procurement quantities, were not available to allow CBO to calculate the budget impact of these changes. In addition, 19 SAR systems were behind their planned delivery schedules (13 of which were also behind in December 1982). Twenty-five other SAR systems reported delays in completing key program milestones, including seven that reported slips for the second year in a row.

Contract cost performance continues to be a problem. Fifty systems reported expected contract overruns ($3 billion) and/or underruns ($0.2 billion) for a net overrun of $2.8 billion (1 percent). In December 1982, a net overrun of $3.8 billion was reported for 37 systems. While these amounts are relatively small compared to the total cost of the systems involved, they may foreshadow major cost growth in future production contracts.

## COMPLETENESS AND ACCURACY OF THE SARS

The SARs are useful for monitoring cost changes and other developments in weapons acquisition programs and for providing rough indicators of overall cost growth. In several respects, however, the SARs continue to contain incomplete, inaccurate, and conflicting information.

### SAR Improvements

During its review of the December 1983 SARs, CBO found several ways of improving the quality of the data included in the SARs.

- All acquisition costs related to a weapons system should be included in the SAR estimates;

- Operating and Support (O&S) cost estimates for planned systems as well as for their antecedent systems should be included in the SARs. Inclusion of these costs would allow comparisons of O&S estimates for planned systems with their predecessors. It would also make possible a total life-cycle cost estimate for each system so that the Congress could see not only the estimated purchase price but also the estimated costs of ownership;

- Cost estimates should be updated to reflect the current most likely cost regardless of the annual budget submission. For example, the Administration revised its budget in May 1984, but the total program impact of the revisions will probably not be included in the SARs until the December 1984 SARs are submitted to the Congress in February or March 1985;

- Information on contract cost performance should include percentage completion data as well as the percent and dollar value of cost and schedule variances. Currently the SARs only identify the dollar value of cost and schedule variances;

- Contract cost information for large programs such as the MX missile and Trident submarine and missile programs should be expanded to include more than just the six largest (in dollar value) contracts;

- Weapons system delivery data included in the December SARs should be consistent with the annual budget justification materials, or appropriate explanations of the differences should be included;

- The unit of measure for calculating annual procurement unit costs and total program unit costs should be the item that the Congress authorizes each year and that DoD procures each year. Specifically, the unit of measure for the Patriot and Pershing II programs should be missiles, not fire control units or battery sets;

- Weapons delivery data should include the planned deliveries for the next four calendar quarters after the current SAR;

- Total program costs that result from applying current inflation indexes should not be artificially reduced to force the estimates to meet OSD budgetary control totals; and

- Given the comprehensive nature of the December SARs, it would be useful for these reports to summarize the changes reported during the year in addition to those for the October-December quarter.

## Offsets to Meet Control Totals

Nearly $1.2 billion in net adjustments were made in the cost estimates for 22 systems to "offset the new economic indices." Otherwise the program costs given in the SARs would have differed from the corresponding costs shown in the President's budget. Either the programs with upward adjustments have now overstated their budget requirements or the programs with downward adjustments have now understated their requirements.

## Exclusion of Costs

The cost estimates for 17 systems excluded at least $23.4 billion in program costs that were footnoted in the SARs or reported in other defense budget documents such as the Congressional Data Sheets. CBO believes



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that all costs directly related to the weapons systems should be included in the SAR estimates. Doing so would raise the December 1983 estimated costs for the 17 systems by about 8 percent.

## Inconsistent Delivery Data

Equipment deliveries reported in the SARs do not always agree with information in the Congressional Data Sheets. Both sources are supposed to reflect the President's budget as of February 1, 1984. Discrepancies were found for 17 of the 96 systems in the December 1983 SARs as compared to 13 of the 62 systems in the December 1982 SARs.

## Lack of SARs for Major Weapons Systems

The Department of Defense Authorization Act of 1983 (Public Law 97-252) set new SAR reporting criteria, including a provision to make SARs for major weapons systems mandatory, not discretionary on the part of DoD. The reporting requirement became effective January 1, 1983, and included the December 1982 SARs. As a result, the number of systems included in the SARs has increased from 46 in September 1982 to 96 in December 1983, and currently over 135 systems are known to meet the SAR criteria. The actual number of systems meeting SAR reporting criteria and being reported varies constantly as new systems meet SAR criteria, old systems end production, and reporting exemptions or deferrals are granted by the Armed Services Committees.

# CHAPTER I. ANALYSIS OF COST CHANGES IN SAR PROGRAMS

As a result of significant increases in budget authority and outlays for defense investment programs in the President's budgets since 1982, the Congress has become increasingly concerned about cost overruns in the acquisition of weapons systems. One of the most comprehensive sources of data on the costs of major weapons programs is the Selected Acquisition Reports (SARs) that the Department of Defense submits quarterly to the Congress.

## SELECTED ACQUISITION REPORTS

Selected Acquisition Reports were developed originally to provide Defense Department officials with various kinds of cost and management information on major weapons systems. They are now also submitted to the Congress to permit the Armed Services Committees to monitor the Department's progress in meeting its procurement plans, and to provide an early warning of emerging cost problems.

The SARs are a compilation of status reports from the program managers responsible for major defense acquisition programs. They provide each program manager's latest estimates of progress in achieving key goals with respect to performance, schedule, and cost. The SARs are prepared on an exception basis for the first, second, and third quarter of each year, with a comprehensive report for the fourth quarter ending December 31. The cost data in the December SARs are expected to correspond to data in the President's annual budget submitted to the Congress in January. The fourth-quarter SARs are usually submitted to the Congress in March.

The Department of Defense Authorization Act of 1983 (Public Law 97-252) requires the Department to submit SARs on acquisition programs that have been designated by the Secretary of Defense as major systems or are estimated to cost more than $200 million for research, development, test, and evaluation, or more than $1 billion for procurement. These thresholds are to be calculated in fiscal year 1980 constant dollars. Highly classified programs are excluded. This reporting requirement became effective on January 1, 1983.

The actual number of SARs constantly varies as new systems reach SAR reporting thresholds, as old systems end production, and as the Armed Services Committees approve or disapprove Department of Defense requests

for reporting exemptions. In February 1983 the DoD identified 129 systems that met SAR reporting criteria. Sixty-two of these appeared in the December 1982 SARs. As of May 1984, 135 systems had been identified as meeting reporting thresholds with 96 appearing in the December 1983 SARs. (Chapter III provides a detailed discussion on the status of all these systems.)

Cost data for the systems covered by the SARs include total program acquisition costs updated to reflect actual cost on delivered systems, as well as anticipated costs for future procurement, which may extend well into the 1990s. Total program cost estimates are provided both in current dollars, including allowance for anticipated inflation, and program base-year dollars. The base year varies by program, but generally it reflects the year in which the Department approves a development or production estimate.

Changes in cost estimates are reported for the current quarter and for the whole period from the base year to date. The changes are calculated in terms of **economic** and **program changes.** Economic changes include changes in the current estimate of total program costs resulting from actual inflation (as opposed to that previously assumed) and from revised assumptions regarding future inflation. Program changes include the following categories:

- Quantity change--a change in the quantity of weapons to be procured.
- Schedule change--a change in a procurement or delivery schedule, completion date, or intermediate milestone for development or production.
- Engineering change--a change in the physical or functional characteristics of the system.
- Estimating change--a change in total program cost resulting from a correction of error made in preparing the original estimate, refinement of a previous current estimate, or a change in program or cost-estimating assumptions and techniques not provided for in the other cost-change categories.
- Support change--any cost change associated with training and training equipment, peculiar support equipment, activation of an operational site, and initial spares and repair parts.
- Other--a change in program cost for reasons not provided for in other cost variance categories.

Table 1 shows the relative importance of the economic and program-change categories for both the fourth quarter of 1983 and from each program's base year to date, as reported by DoD. Quantity changes account for over 44 percent of the total cost change from base year to the date reported in the December SARs. Support changes and engineering changes each account for about 13 percent of total cost changes from base year to date. The remaining 30 percent of total cost change reported to date is distributed fairly evenly among the economic, schedule, and estimating change categories.

TABLE 1. DISTRIBUTION OF NET COST CHANGES BY CATEGORY OF CHANGE (In billions of dollars)

| Category of Change | Fourth Quarter 1983 | Program Base Year to End of 1983 |
|---|---|---|
| Economic Change | -13.6 | 26.0 |
| Program Change | | |
| Quantity change | 17.7 | 123.4 |
| Schedule change | 3.5 | 30.6 |
| Engineering change | 6.5 | 35.3 |
| Estimating change | -5.5 | 24.9 |
| Support change | 3.0 | 36.1 |
| Other | 0.0 | 2.2 |
| Subtotal | 25.2 | 252.6 |
| Total Cost Change | 11.6 | 278.6 |

SOURCE: Department of Defense.

## ANALYSIS OF COST CHANGES DURING THE 1983 FOURTH QUARTER

The Department of Defense, in its overview statement on the December SARs, reported that total estimated costs had increased by $11.6 billion since its report of September 30, 1983, as compared with reported decreases

of $18.4 billion for the fourth quarter of 1982. After making several adjustments for accounting changes contained in the December 1982 SAR, CBO calculated the cost change in the fourth quarter of 1982 to be a $2.4 billion increase. 1/

The reported cost changes for the fourth quarter apply only to the weapons systems covered by the September SARs. As shown in Table 1, the lower inflation assumptions used by the Department account for a $13.6 billion reduction. The changes in inflation assumptions are shown in Table 2.

TABLE 2. CHANGES IN ADMINISTRATION PROJECTIONS OF FUTURE INFLATION RATES FOR PROCUREMENT OF MAJOR SYSTEMS (By fiscal year, in percents)

| Budget Date | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|
| January 1983 | 6.4 | 6.1 | 5.8 | 5.8 | 5.8 |
| January 1984 | 6.4 | 6.0 | 5.6 | 5.2 | 4.8 |

SOURCE: Compiled by CBO from data provided by DoD.

Quantity changes made in the 73 systems covered by the September SARs account for $17.7 billion in higher total costs reported by DoD. These increases can occur for a variety of reasons, though most often the causes are force growth, modernization, and replacement due to age or accidents. The largest quantity increases were reported in the F-16 program ($4.5 billion for 486 additional aircraft), the DDG-51 program ($4.4 billion for five additional ships), and the F-14 program ($3.4 billion for 54 additional aircraft). Other systems with large quantity increases include the CG-47 cruiser, the Trident II submarine, and the SSN-688 submarine. An extensive discussion of 1985-1986 quantity changes appearing in the SARs can be found in the CBO report, An Analysis of the President's Budgetary Proposals for Fiscal Year 1985 (February 1984).

1. See Congressional Budget Office, A Review of the Department of Defense December 31, 1982 Selected Acquisition Reports (SARs) (August 1983).

Excluding the net increase attributed to the the economic and quantity changes leaves an increase of $7.5 billion (1.2 percent) resulting from engineering, estimating, schedule, and support changes.

## ANALYSIS OF COST CHANGES DURING 1983

The December SARs typically include the most changes of all the quarterly SARs. Many of the reported cost changes reflect decisions to increase or decrease the quantity of weapons to be procured, to be consistent with the Administration's defense plans as outlined in the President's annual budget and the Department's five-year defense plan. In order to be consistent with the economic assumptions underlying the President's annual budget, the December SARs may also include revised inflation assumptions for calculating future acquisition costs. The Department's reporting guidelines also require the December SARs to be a comprehensive annual report, and to include considerably more data on the technical and operational characteristics, schedule milestones, and program acquisition costs than the other quarterly SARs. 2/

Given the comprehensive nature of the December SARs, CBO believes it would be useful for these reports to include calculations of the cost changes during the calendar year as well as the October-December quarter. This additional information would provide a more complete picture of changes in estimated costs for major weapons systems, and would summarize cost changes reported for other quarters of the year.

Using the Department's data, Table 3 provides CBO's calculations of cost changes in SAR systems during 1983. These calculations cover 62 major weapons systems that were included in both the December 1982 and December 1983 SARs. The addition and deletion of weapons systems from the SARs during the year distorts the calculation of cost change for weapons procurement. A clearer picture of cost change is obtained by limiting the analysis to a constant number of SAR systems. 3/

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2. For further details on DoD reporting guidelines for SARs, see Department of Defense Instruction, Selected Acquisition Reports, No. 7000.3, March 2, 1983.

3. During the year, no weapons systems were removed from the quarterly SARs and 34 systems were added, including 23 in the December SARs.

TABLE 3. NET COST CHANGES FOR 62 MAJOR WEAPONS SYSTEMS DURING CALENDAR YEAR 1983, BY CATEGORY OF CHANGE

| Category of Change | Current-Year Dollars | Base-Year Dollars |
|---|---|---|
| | In Billions of Dollars | |
| Total Estimated Cost, 62 Systems, December 1982 | 539.7 | 257.2 |
| Cost Changes During 1983 | | |
| Economic change | -11.8 | N/A |
| Quantity change | 21.0 | 8.5 |
| Other program change | 5.4 | 2.1 |
| Net change | 14.6 | 10.6 |
| Total Estimated Cost, 62 Systems, December 1983 | 554.3 | 267.8 |
| | In Percents | |
| Total Estimated Cost Change | 2.7 | 4.1 |
| Program-Cost Change Excluding Economic Change | 4.9 | 4.1 |
| Program-Cost Change Excluding Economic and Quantity Changes | 1.0 | 0.8 |

SOURCE: Compiled by CBO from 1983 SARs.

As shown in Table 3, the net change in estimated total costs for the 62 major weapons systems included in the SARs throughout calendar year 1983 was an increase of $14.6 billion (2.7 percent) measured in current-year dollars. The current-year dollar change included a decrease of $11.8 billion for revised inflation assumptions. Excluding this economic change, the program-cost changes totaled $26.4 billion (4.9 percent) in current-year dollars, and $10.6 billion (4.1 percent) in base-year dollars. All of these

figures represent an increase from last year. Adjustments for quantity changes, however, make a substantial difference in the analysis. Excluding both economic and quantity changes, the other program-cost changes totaled $5.4 billion (1.0 percent) in current-year dollars and $2.1 billion (0.8 percent) in base-year dollars. These other program-cost changes are primarily for engineering, estimating, schedule, and support-cost changes.

By excluding economic and quantity changes from the annual cost-change calculations, one gets a better indication of what success the Department of Defense is having in its effort to curtail cost growth in weapons acquisition through various management initiatives. These initiatives include budgeting for the most likely cost, budgeting for technological risk, and more realistic budgeting for inflation. The Department also has reportedly given higher priority to contract-cost auditing, and has increased attention to cost and cost monitoring by having senior management regularly review individual programs.

Not all program-cost changes are the responsibility of DoD management. Many factors influencing estimated costs are beyond the control of the program manager. For example, the unexpected capability of a potential enemy to jam the guidance system of an air-to-air missile may require an engineering change to counter it. Therefore, program-cost changes, excluding economic and quantity changes, can serve only as a very general indication of the impact of the Department's efforts to improve acquisition programs.

## ANALYSIS OF ANNUAL COST CHANGES SINCE 1977

In order to gauge the relative magnitude of the 1983 cost changes and the possible impact of the DoD management initiatives, CBO calculated annual cost changes since December 1977. These calculations employ the same methodology as was used to measure cost change during 1983--that is, each annual cost change represents the change in estimated total costs from December to December for a constant set of weapons systems. Weapons systems added or deleted to the SARs during a year were excluded from the analysis. Table 4 provides some descriptive data about the systems included in the CBO analysis.

Another approach would be to measure cost change for only those systems that are covered by SARs for the entire period. This would have the effect, however, of reducing considerably the data base for the analysis. For the entire period from December 1977 to December 1983, SARs cover only 27 weapons systems.



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TABLE 4. DESCRIPTIVE CHARACTERISTICS OF SYSTEMS INCLUDED IN THE CBO COST-CHANGE ANALYSIS

| Characteristic | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|
| Number of Systems | 47 | 50 | 46 | 46 | 43 | 62 |
| Average Age (Years) a/ | 6.9 | 7.0 | 7.3 | 7.7 | 8.3 | 7.4 b/ |
| Total Cost at Period End (Billions of current-year dollars) | 208.0 | 250.6 | 304.6 | 407.3 | 452.5 | 554.3 |

SOURCE: Compiled by CBO from data included in the December SARs.

a. Measured from the program base.

b. Three SARs--the Army and Marine Corps LAV and the Navy Trident II Submarine--have base years that do not accurately reflect the age of the systems. If these SARs are excluded the average age rises to 7.7 years.

The results of CBO's analysis of cost change since 1977 are summarized in Tables 5 and 6. Table 5 shows the annual cost changes in both current-year and base-year dollars. Table 6 shows the program-cost changes, excluding economic change, in terms of percentage change from the estimated system costs at the beginning of each year.

As discussed earlier, the economic change category in the current-year dollar figures measures only the change in the latest estimate of total program costs resulting from actual inflation (as opposed to that previously assumed) and from revised assumptions regarding future inflation. Measuring change in constant base-year dollars removes all of the effects of inflation. The base year varies by program, however, so that these data are not a usual constant-dollar series with a common base year.

These results show that, while total program cost change for SAR systems during 1983 was higher than during 1982, it was lower when adjusted

TABLE 5. ANNUAL COST CHANGES FOR SELECTED MAJOR WEAPONS SYSTEMS SINCE DECEMBER 1977 (In billions of dollars)

| Category of Change | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|
| | | | Current-Year Dollars | | | |
| Economic Change | 1.5 | 16.2 | 7.9 | 3.8 | -9.9 | -11.8 |
| Quantity Change | 6.2 | 2.0 | 10.9 | 70.0 | -1.8 | 21.0 |
| Other Program Change | 7.6 | 12.0 | 35.1 | 37.4 | 17.6 | 5.4 |
| Total | 15.3 | 30.2 | 53.8 | 111.2 | 5.8 | 14.6 |
| | | | Base-Year Dollars | | | |
| Quantity Change | 2.2 | 0.9 | 3.3 | 18.5 | -1.4 | 8.5 |
| Other Program Change | 2.5 | 4.1 | 9.7 | 10.6 | 4.9 | 2.1 |
| Total | 4.7 | 5.0 | 13.0 | 29.1 | 3.5 | 10.6 |

SOURCE: Compiled by CBO from December SARs.

for quantity change. The 1983 percentage increase in program costs, excluding quantity change, was lower than in any of the previous five years (see Figure 1). This lends some support to the Department's claim that the cost changes reported in the December 1983 SARs reflect the success of its efforts since 1981 to reduce cost growth.

The results are not conclusive, however, for several reasons. First, since the costs reported in the SARs include both actual costs and DoD's projections of future costs, the accuracy of these projections will not be known until all of the weapons have been produced and delivered. Furthermore, according to the Administration's revised budget dated May 3, 1984, many of the systems included in the SARs will experience further cost growth because of planned program stretchouts (see Table 9, Chapter II).

Second, the SAR data cover only a limited part of the Department's spending for weapons acquisition. Systems included in the December 1983

TABLE 6. ANNUAL RATES OF PROGRAM COST CHANGES (EXCLUDING ECONOMIC CHANGE) FOR MAJOR WEAPONS SYSTEMS SINCE DECEMBER 1977 (In percents)

| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|
| Current-Year Dollars | | | | | | |
| Total Program Cost Change a/ | 7.2 | 6.4 | 18.3 | 36.3 | 3.5 | 4.9 |
| Program Cost Change Excluding Quantity Change b/ | 3.9 | 5.4 | 14.0 | 12.6 | 3.9 | 1.0 |
| Base-Year Dollars c/ | | | | | | |
| Total Program Cost Change a/ | 4.2 | 4.1 | 10.1 | 21.0 | 1.8 | 4.1 |
| Program Cost Change Excluding Quantity Change b/ | 2.3 | 3.4 | 7.6 | 7.7 | 2.5 | 0.8 |

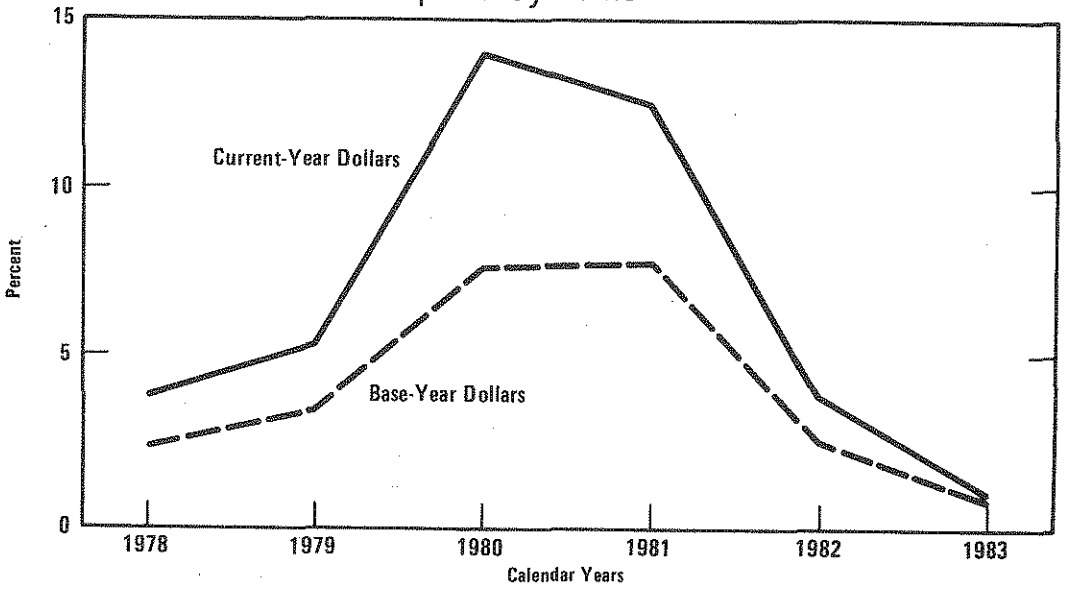
SOURCE: Complied by CBO from December SARs.

a. Excludes economic change--that is, changes in the inflation assumptions used in the cost estimates.
b. Excludes changes in cost resulting from change in quantities procured.
c. The base year varies by program, but generally reflects the year in which a development or production estimate is approved by the Department.

SARs account for about half of the Administration's 1985 defense procurement request. Furthermore, of the 112 weapons systems that both meet the current criteria for inclusion in the Department's reports to the Congress and have not been exempted from SAR requirements by the Congress, only 96 were covered in the December 1983 SARs.

Another limitation in the SAR data is that the cost changes reported each year may not accurately represent program-cost growth. For example, the MX missile was added as a SAR system in 1983, but all development funds authorized prior to 1983 were omitted. This omission presents a

Figure 1. Annual Rates of Program Cost Growth (Excluding Economic and Quantity Changes) for Selected SAR Weapons Systems




distorted picture of the total cost of that program. There are numerous other indications that the latest SAR data may not reflect ultimate acquisition costs. Chapter II shows that several individual weapons systems continue to experience substantial cost growth, that decisions to slow production rates (and increase unit costs as a result) continue to be made, and that recent production-schedule slippages and contract overruns may not be reflected in current cost estimates.

Nevertheless, the variety and quantity of data contained in the SARs are very valuable. The SARs are useful for monitoring cost changes and other developments in weapons acquisition programs, and for providing rough indicators of overall cost growth in procurement programs.

## CHAPTER II. CONTINUED COST GROWTH IN INDIVIDUAL SYSTEMS

The first chapter discussed cost growth for all SAR weapons systems taken together. This chapter narrows the focus to individual systems and analyzes cost growth in terms of:

- Unit costs and the Nunn-McCurdy Amendment;
- Effects of production schedule changes; and
- Indications of potential future cost growth.

The analysis shows that some weapons systems are continuing to experience substantial cost growth.

### UNIT COSTS AND THE NUNN-McCURDY AMENDMENT

The 1983 Defense Authorization Act (Public Law 97-252) requires that the Congress be notified when either total program acquisition unit costs or 1983 procurement unit costs are more than 15 percent higher than the baseline for a particular program. This notification process serves as an early warning system to alert the Congress to those weapons systems that are having cost growth problems. The Congress can then take whatever action it deems necessary. For the December 1983 SARs, a program's baseline is the cost estimate given in the first SAR submitted to the Congress on that program, or in the December 1982 SAR, whichever is later. Under this procedure, a new baseline estimate is used for each year's calculations. Thus the base from which cost growth is measured increases each year as costs increase. If the unit-cost growth exceeds the baseline by 25 percent or more, the Secretary of Defense must certify in writing that the system is required.

In the December 1983 SARs, three systems showed unit-cost increases exceeding 15 percent (see Table 7). One of these systems, the Pershing II missile, experienced a large unit-cost increase but the provisions of the Nunn-McCurdy Amendment did not require DoD to report it to the Congress. All three systems exceeded one of the unit-cost thresholds by more than 25 percent. None of these systems was among the 11 systems that exceeded at least one of the two unit-cost thresholds one year earlier. Only two of these eleven systems--Tomahawk and Maverick missiles--had unit-cost increases near either of the thresholds again this year. In contrast,

seven of these systems showed a decrease in one or both unit-cost categories (see Appendix A).

## Causes of Unit-Cost Increases

Unit-cost growth can be traced to a number of causes. One of the threshold breaches (the Pershing II missile) was primarily caused by a stretchout of the previously planned quantities. Twenty-five missiles have been shifted from the 1984 plan to the last year of the program, thereby creating a less efficient production rate in 1984 and increasing the exposure of the 25 units to higher prices in the future. The cancellation of another program (the Light Armored Vehicle) caused its cost estimate to breach the threshold. Cancellation of a program raises unit costs by leaving only the units that have been procured to share the fixed costs such as research and development and production tooling. Cancellation of the Army's LAV program resulted in reducing the planned quantity from 750 units to 37 units. 1/ Although the Army's LAV was not expected to incur significant development costs, it was a joint program with the Marine Corps, which will now have to spread the fixed production costs, such as tooling, among only the Marine Corps' 751 units as opposed to 1,501 units for both services. Finally, the cost estimate for the Inertial Upper Stage vehicle breached the threshold because of a significant reduction in planned quantities from 18 to 10, which also shifts fixed development and production costs to fewer units.

## One Large Cost Increase Not Reported by DoD Under the Nunn-McCurdy Amendment Procedures

One significant unit-cost increase included in Table 7 was not reported by DoD--the Pershing II missile. The Pershing II missile program includes missiles, launcher modifications, reference scene generation facilities (RSGF), and platoon control centers (PCC). These units, taken together, make up battery sets or battery equivalents. A battery set is defined as nine missiles, nine launcher modifications, one RSGF, and four PCCs. Because DoD now computes unit prices for the program on the basis of battery sets, the increased unit cost of the missile itself is not readily apparent. If one uses missiles as the basis for computing unit costs, however, the program exceeds the 1984 procurement unit-cost threshold by about 29 percent.

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1. The 1984 Defense Authorization Act (Public Law 98-94) directed that the Army transfer these units to the Marine Corps.

## THE NUNN-McCURDY AMENDMENT

The 1983 Defense Authorization Act (Public Law 97-252) established a three-tiered reporting requirement to identify programs that have significant cost growth. The purpose is to provide a means by which the Congress can become aware of cost growth early enough to take remedial action. The so-called Nunn-McCurdy Amendment requires that the secretaries of the Army, Navy, and Air Force notify the Congress of programs in which: (1) the program acquisition unit cost is more than 15 percent above the baseline or (2) the procurement unit cost for fiscal year 1983 is more than 15 percent above the baseline. If unit-cost growth exceeds the baseline by 25 percent or more, the Secretary of Defense must certify in writing that the system is required.

The baseline used for these reports is the cost estimate in the first SAR submitted to the Congress on the program, or the estimate in the December SAR for the fiscal year immediately before the current fiscal year, whichever is later. Thus the baseline is updated annually. All costs are measured in current rather than constant dollars. Authority to obligate funds for a program is automatically terminated if the service secretary does not submit a report within 30 days or if the Secretary of Defense fails to certify the system requirement within 60 days of the breach determination. The prohibition on the obligation of funds does not apply if the increase was caused by terminating or cancelling acquisition programs.

The Army has used both battery sets and missiles as the basis for computing procurement unit cost. Last year's SAR used both measures; this year's report uses battery sets; future reports will use missiles, according to a footnote in this year's SAR. The Armed Services Committees have historically based their authorizations on the number of Pershing II missiles to be procured, not on the number of battery sets.

The estimates in last year's SAR (December 1982) are the baseline for the Pershing II missile's unit-cost calculations. Therefore, CBO used both battery sets and missiles in the computations; unit costs are under the relevant threshold based on battery sets, but exceed the procurement unit-cost threshold by about 29 percent based on missiles.



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TABLE 7. BREACHES OF NUNN-McCURDY AMENDMENT THRESHOLDS (In percents)

| System | 1984 Procurement Unit Cost Above Baseline | Total Program Acquisition Unit Cost Above Baseline |
|---|---|---|
| Army | | |
| Pershing II Missile | 29.4 a/ | -- |
| Light Armored Vehicle | -- | 49.6 |
| Air Force | | |
| Inertial Upper Stage Vehicle | -- | 49.9 |

SOURCE: Compiled by CBO from data provided by the Department of Defense.

a. Unit-cost increase based on the number of missiles procured. For 1985, DoD reported unit-cost data in terms of battery sets procured. In future years missiles will be the unit of measure.

## EFFECTS OF PRODUCTION RATES ON COSTS

When a weapons system is acquired over a period of years, the rate of production per year and the total quantity to be procured will often vary from initial plans. These changes can result from any number of factors, such as material or labor shortages, production line changes, changes in Soviet weaponry, or budget ceilings that result in reallocating dollars to fewer systems. Table 8 shows the effect of production schedule changes that occurred between September 30 and December 31, 1983. A total of 27 systems changed their production schedules at a net cost of $2.4 billion.

When production rates are stepped-up, savings generally occur because the use of facilities comes down to their capacities. For this reason, DoD's recent management initiatives include economic production rates. Table 8 indicates that five SAR systems have raised their planned production rates at a savings of $0.5 billion. In comparison, the December 1982 SARs reported that eight systems had raised their planned production rates at savings of $0.8 billion.

In contrast, the SARs also provide evidence that the production rates for many programs have been slowed--at a large cost penalty. A program stretchout occurs when (1) the procurement schedule is changed so that weapons system orders are moved from the early years of a program to later years, or (2) a program is extended beyond the period for which it was planned without increasing quantities. Stretchouts increase costs because production levels become less efficient. Table 8 shows that 22 SAR systems have incurred program stretchouts that have increased estimated costs from those in the September 1983 SARs by about $2.9 billion or 2 percent. The December 1982 SARs reported 20 systems that incurred program stretchouts at a cost of $5.6 billion. Thus, although the number of systems being stretched has risen by two systems, the dollar cost is lower by nearly 50 percent.

Of the 27 systems with production rate changes discussed above, 14 were among those with similar changes reported in the December 1982 SARs. Eight of these systems experience schedule stretchouts in each year. Three systems that moved toward more efficient production rates in December 1982 reversed direction and stretched their schedules in December 1983. In contrast, three systems report more efficient production rates in December 1983 than they did a year earlier. As the next section of this report points out, DoD's May 1983 budget revision proposes additional program stretchouts that could have similar cost consequences. But since data on future production rates are not available, the actual cost consequences cannot be measured.

## INDICATIONS OF FUTURE COST GROWTH

In analyzing the December SARs, CBO found several possible sources of future cost growth. This section discusses program stretchouts, schedule performance, contract cost performance, and other indications of potential future cost growth. While each of these factors may result in cost growth, it is not possible to predict the actual result.

### Further Program Stretchouts

The changes made to the President's 1985 budget indicate that many more programs will incur increased costs because of program stretchouts. Historically, reductions in procurement quantities and delays in development efforts have been used to reduce costs in the budget year without cancelling programs. The 1985 budget revision suggests that this technique is still being used, with cost increases as an unavoidable consequence. The DoD's

TABLE 8. COSTS OF PROGRAM STRETCHOUTS AND SAVINGS FROM MORE EFFICIENT PRODUCTION RATES, SEPTEMBER TO DECEMBER 1983 (In millions of dollars)

| System | Costs | Net Savings | Change |
|---|---|---|---|
| Army | | | |
| CH-47D Helicopter | 155.1 | -- | |
| Fighting Vehicle System | 194.7 a/ | -- | |
| Hellfire Missile | 18.4 a/ | -- | |
| M-1 Tank | -- | 205.1 a/ | |
| Patriot Missile | 133.4 a/ | -- | |
| Pershing II Missile | 54.6 | -- | |
| Stinger Missile | 47.6 a/ | -- | |
| Subtotal | 603.8 | 205.1 | 398.7 |
| Navy | | | |
| AV-8B Aircraft | 852.9 a/ | -- | |
| Battleship Reactivation | 127.9 | -- | |
| CH-53E Helicopter | 4.1 | -- | |
| F/A-18 Aircraft | 313.1 a/ | -- | |
| HARM Missile | -- | 18.7 | |
| Joint Tactical Information Distribution System | 55.6 | -- | |
| LAMPS MK III System | 5.6 | -- | |
| Light Armored Vehicle | -- | 28.6 | |
| Landing Craft, Air Cushion | 5.1 | -- | |
| Phoenix Missile | 2.5 | -- | |
| Sparrow Missile | b/ | -- | |
| TACTAS Sonar | 12.9 | -- | |
| Tomahawk Cruise Missile | 418.1 | -- | |
| Subtotal | 1,797.8 | 47.3 | 1,750.5 |

| | |
|---|---|
| F-15 Aircraft | Deletes 6 aircraft from 1985. |
| ISA/AMPE Message Processing Equipment a/ | Defers initial contractor design effort. |
| OTH-B Radar | Defers first sector of the west coast system. |
| AMRAAM Missile | Defers 154 missiles, spares and advance procurement. |
| IIR Maverick Missile | Defers 1,900 missiles, spares and advance procurement. |
| KC-135 Reengining | Deletes 17 kits. |
| LANTIRN System | Rephases 9 pod sets to 1986. |
| HH-60D Helicopter | Reduces operating support, advance procurement, and avionics suites. |
| C-5B Aircraft | Defers 2 aircraft and advance procurement. |
| PLSS Strike System | Defers the full-production milestone date and spares requirements. |
| Low Level Laser Guided Bomb a/ | Slows procurement of bomb kits. |

SOURCE: Compiled by CBO from data provided by DoD.

NOTE: The revised budget request is not sufficiently detailed to allow CBO to calculate the total cost of these program stretchouts.

a. This system was not included in the SARs until March 31, 1984.

TABLE 9. SAR SYSTEMS WITH PROPOSED PROGRAM STRETCHOUTS INCLUDED IN DOD's 1985 REVISED BUDGET REQUEST, MAY 3, 1984

| System | Description of Program Stretchout |
|---|---|
| Army | |
| AH-64 Helicopter | Delays 32 aircraft and spare parts. |
| UH-60 Helicopter | Defers one flight simulator. |
| Patriot Missile | Deletes 3 fire units, 140 missiles, and spare parts. |
| TOW 2 Missile | Delays procurement of 12,000 missiles. |
| Hellfire Missile | Delays procurement of 1,000 missiles. |
| Fighting Vehicle System | Defers 55 vehicles, an unstated number of Bushmaster guns, and spare parts. |
| M-1 Tank | Delays 120 tanks. |
| DIVAD Gun | Delays 15 units, advanced procurement, and spare parts. |
| Aquila Remotely Piloted Vehicle | Defers initial production to 1986. |
| Stinger Missile | Stretches the Reprogramable Micro-Processor (RMP) development effort and delays RMP capability. |
| Navy | |
| AV-8B | Delays development of trainer aircraft. |
| F/A-18 Aircraft | Defers 18 aircraft from 1986. |
| SSN-688 Submarine | Defers 1 submarine. |
| Standard Missile 2 | Defers nuclear missile option. |
| DDG-51 Destroyer | Slows down combat systems development improvements. |
| CG-47 Cruiser | Delays software systems upgrades. |
| Trident II Submarine | Delays other procurement for Kings Bay, Georgia, support facilities. |
| P-3C Aircraft | Delays Radar System Improvement project. |
| Air Force | |
| F-16 Aircraft | Defers 36 aircraft from 1986, reduces advanced procurement and support equipment, and delays procurement of Multiple Stores Ejection Rack. |

| | | | |
|---|---|---|---|
| Air Force | | | |
| AMRAAM Missile | 3.7 a/ | -- | |
| HARM Missile | -- | 176.6 | |
| HH-60D Helicopter | 144.7 a/ | -- | |
| LANTIRN System | -- | 75.5 a/ | |
| IIR Maverick Missile | 139.7 a/ | -- | |
| MX Missile | 132.9 | -- | |
| T-46A Aircraft | 100.7 | -- | |
| Subtotal | 521.7 | 252.1 | 269.6 |
| Total | 2,923.3 | 504.5 | 2,418.8 c/ |

SOURCE: Compiled by CBO from the December 31, 1983, SARs.

NOTE: Program costs are generally incurred when production schedules are stretched out, leading to less economic production rates and/or more inflation expense per unit produced. By contrast, advancing production schedules usually reduce program costs. Exceptions may occur, as when new tooling is required to support higher production rates.

a. DoD's 1985 Budget Revision, dated May 3, 1984, proposes a further stretchout of this program.

b. The cost of this stretchout could not be determined using the SAR information.

c. Excludes a net increase of $1,058.5 million for other schedule changes such as terminations, reductions, and the schedule portion of quantity changes.

TABLE 10. SAR PROGRAMS WITH MILESTONE AND DELIVERY SCHEDULE CHANGES BETWEEN SEPTEMBER 30, 1983, AND DECEMBER 31, 1983

| System | Number of Schedule Milestones | | System Ahead of or Behind the Delivery Schedule |
|---|---|---|---|
| | Ahead | Behind | |
| Army | | | |
| Army Data Distribution System | -- | 2 | -- |
| AH-64 Helicopter | 1 | -- | -- |
| AHIP Helicopter | -- | 1 | -- |
| AN/TTC-39 Switching System | -- | -- | Ahead |
| CH-47D Helicopter | -- | -- | Ahead |
| DIVAD Gun | -- | 1 | Behind |
| Fighting Vehicle System | -- | 1 | Behind |
| Hellfire Missile | -- | 1 | Behind |
| Joint Tactical Information Distribution System | 2 | 3 | -- |
| Light Armored Vehicle | -- | 1 | -- |
| Multiple Launch Rocket System | -- | -- | Behind |
| Patriot Missile | -- | -- | Behind |
| Pershing II Missile | -- | 1 | Behind |
| Aquila Remotely Piloted Vehicle | -- | -- | Behind |
| TOW 2 Missile | -- | -- | Behind |
| Navy | | | |
| AV-8B Aircraft | -- | 1 | Behind |
| Battleship Reactivation a/ | 1 | 3 | -- |
| CAPTOR Torpedo System | -- | -- | Behind |
| CG-47 Cruiser a/ | -- | -- | -- |
| CH-53E Helicopter | -- | -- | Ahead |
| CVN Carrier a/ | -- | -- | -- |
| DDG-51 Destroyer | 1 | 1 | -- |
| E-6 Aircraft a/ | -- | -- | -- |
| F-14 Aircraft | -- | -- | Behind |
| HARM Missile | -- | 1 | -- |
| Harpoon Missile | -- | -- | Ahead |
| Joint Tactical Information | | | |

| | | | |
|---|---|---|---|
| Distribution System | -- | 10 | -- |
| LAMPS MK III Helicopter | -- | -- | Ahead |
| Light Armored Vehicle | -- | 2 | Behind |
| MK 50 Torpedo | -- | 1 | Ahead |
| Phoenix Missile | -- | 4 | Behind |
| Sparrow Missile | -- | -- | Behind |
| Tomahawk Missile a/ | -- | 5 | Behind |
| Trident I Missile | -- | -- | Behind |
| Air Force | | | |
| ALCM Missile | -- | -- | Ahead |
| Defense Satellite Communications System | -- | 1 | -- |
| E-3A Aircraft | 1 | -- | -- |
| F-15 Aircraft | -- | -- | Ahead |
| F-16 Aircraft | -- | -- | Ahead |
| GLCM Missile | -- | 2 | Ahead/Behind b/ |
| HH-60D Helicopter | -- | 5 | -- |
| Inertial Upper Stage Vehicle | -- | 1 | -- |
| Joint Tactical Information Distribution System | 1 | 6 | -- |
| LANTIRN System a/ | -- | 3 | -- |
| IIR Maverick Missile | -- | -- | Ahead |
| NAVSTAR Global Positioning System | -- | 4 | -- |
| Sidewinder Missile | -- | -- | Behind |
| Sparrow Missile | -- | -- | Behind |
| T-46A Aircraft | -- | 2 | -- |

SOURCE: Compiled by CBO from the December 31, 1983, SARs.

a. Major milestones that were to-be-determined (TBD) have been assigned dates or milestones that had dates have been changed to TBD.

b. Program has two or more items for delivery, one of which is ahead of schedule and one behind schedule.

revised 1985 budget request, dated May 3, 1984, proposes additional program stretchouts for 28 of the systems that were included in the December 1983 SARs (see Table 9). Of these 28 systems, nine systems are among those that reported a stretchout in the December 1983 SARs and four of those nine also reported stretchouts in the December 1982 SARs. Revised budget documentation does not include the total program information, such as yearly procurement quantities, that CBO would need to calculate the total cost of these program stretchouts. In some cases complete units are being delayed. For example, 32 AH-64 Helicopters are being deferred. In other instances only relatively minor delays are involved as with the CG-47 Cruiser software system upgrades. In either case, the revised budget would lead to short-run budget year savings but greater costs in the long run.

## Schedule Performance

One measure of schedule performance is the degree to which contractors are meeting planned delivery schedules. According to the SARs, 77 systems remain on or ahead of planned schedules for delivery of equipment, while 19 are behind (see Table 10). 2/ Of these 19 SAR systems, 13 also reported delayed deliveries in the December 1982 SAR. As Chapter III of this report points out, however, substantial differences exist between the actual deliveries included in the December SARs and those reported in the Congressional Data Sheets, both of which are supposed to be consistent with the President's budget request.

Among the many reasons for delivery problems are technical difficulties, material shortages, and strikes. Although these can entail significant costs, they may also have more critical consequences by delaying force modernization and hindering readiness.

Another measure of schedule performance is the degree to which a system is completing its key program milestones on time--for example, such milestones as completion of testing, a production decision, or the awarding of contracts. CBO's review of the December SARs revealed that 25 systems had experienced delays in completing some of these milestones. Table 10 provides the number of schedule milestones slipped for each system since the September SARs. The amount of time involved in a slip ranged from one to 14 months.

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2/ Programs on or ahead of planned schedules for delivery of equipment include those that have not yet begun deliveries of any type.

Major milestone delays are important for what they suggest about program execution. If initial flight testing of a missile is delayed three months, this will probably not of itself involve additional costs. But a delay caused by technical, material, or manpower problems may require additional funds to resolve. Milestone delays may also serve as leading indicators of future delivery delays.

Twenty-seven of the systems that reported milestone or delivery schedule changes in the December 1983 SARs also reported such changes in the December 1982 SARs. Thirteen of these systems are behind planned deliveries for the second year in a row, while six are ahead of schedule for the second consecutive year. Seven systems report milestone slips for the second year in a row, but many of these are different milestones than were previously missed.

## Contract Cost Performance

Under the SAR reporting guidelines, as well as under current law, DoD must report contractor cost information for the six largest (in dollar value) contracts in each program. These six contracts normally exclude subcontracts as well as study and service contracts. The reporting of contract information commences as soon as the contractor is authorized to begin work, and normally ends when the contract is 90 percent complete unless the service is notified by DoD to continue reporting. Thus, the specific contracts included in the SAR are constantly changing as new contracts are signed and old contracts reach 90 percent completion. While six contracts may include a major portion of the contract effort of a small program like the Army's TOW-2 missile, this is not the case with large programs like the Air Force's MX missile or the Navy's Trident programs. For example, the number of current contracts for the MX missile exceeds 30.

Congressional oversight of contractor cost performance is further complicated by the SAR reporting criteria. Cost and schedule variances are reported for each contract in dollars but not in percentages. For example, knowing that a contract is $10 million over cost and $20 million behind schedule is not meaningful unless one knows the base against which these variances were calculated--namely, the budgeted cost of work performed, the budgeted cost of work scheduled, and the percentage of completion.

Lacking the above information, CBO must rely on program managers' estimates of contracts that are expected to overrun or underrun their target prices (see Tables 11 and 12). Forty-five systems, or about half of the SAR systems, now report expected contract overruns totaling about $3 billion. Nine of the 45 systems also report expected contract underruns totaling

TABLE 11. CONTRACTS THAT ARE EXPECTED TO OVERRUN THEIR TARGET PRICES

| Program | Number of Contracts | Percent Over Target Prices a/ | Total Amount of Overrun (millions of dollars) |
|---|---|---|---|
| Army | | | |
| AH-64 Helicopter | 3 | b/ | b/ |
| AHIP Helicopter | 1 | b/ | b/ |
| Copperhead Projectile | 1 | 1 | 1 |
| DIVAD Gun | 3 | b/ | b/ |
| Fighting Vehicle System | 1 | 1 | 3 |
| Hellfire Missile | 6 | b/ | b/ |
| M-1 Tank | 1 | b/ | b/ |
| Multiple Launch Rocket System | 3 | b/ | b/ |
| Patriot Missile | 1 | b/ | b/ |
| Pershing II Missile | 2 | b/ | b/ |
| Aquila Remotely Piloted Vehicle | 2 | 10-37 | 132 |
| TOW 2 Missile | 1 | b/ | b/ |
| Navy | | | |
| AV-8B Aircraft | 1 | 2 | 11 |
| Battleship Reactivation | 1 | 7 | 13 |
| CG-47 Cruiser | 3 | 1-4 | 36 |
| CH-53E Helicopter | 1 | 9 | 5 |
| F/A-18 Aircraft | 1 | 5 | 63 |
| E-6 Aircraft | 1 | 184 | 183 |
| FFG-7 Frigate | 2 | b/ | b/ |
| HARM Missile | 1 | 7 | 8 |
| LAMPS MK III System | 1 | b/ | b/ |
| LSD-41 Landing Ship | 1 | 4 | 15 |
| SSN-688 Submarine | 2 | 2-16 | 97 |
| Standard Missile 2 | 1 | 2 | 3 |
| Submarine Advanced Combat System | 1 | 15 | 13 |

| | | | |
|---|---|---|---|
| TACTAS Sonar | 2 | 3-22 | 7 |
| Tomahawk Missile | 4 | 1-43 | 40 |
| Trident I Submarine | 3 | 7-15 | 287 |
| Air Force | | | |
| AMRAAM Missile | 1 | 32 | 135 |
| B-52 OAS/CMI Modifications c/ | 1 | 6 | 11 |
| OTH-B Radar | 1 | 2 | 4 |
| Defense Support Program | 4 | 1-8 | 22 |
| E-3A Aircraft | 1 | 4 | 2 |
| F-16 Aircraft | 6 | 1-58 | 929 |
| GLCM Missile | 4 | 1-9 | 19 |
| Inertial Upper Stage (IUS) Vehicle | 1 | 18 | 118 |
| KC-10 Aircraft | 1 | 88 | 127 |
| IIR Maverick Missile | 4 | 6-13 | 56 |
| NAVSTAR Global Positioning System | 3 | 10-26 | 50 |
| MX Missile | 2 | 5-12 | 58 |
| Precision Location Strike System | 1 | 17 | 59 |
| Space Defense System | 3 | 10-28 | 109 |
| T-46A Aircraft | 2 | 12-20 | 36 |
| TRI-TAC Communications Program | 2 | 13-17 | 19 |

SOURCE: Compiled by CBO from the December 31, 1983, SARs.

a. Percent range is for multiple contracts.

b. The amount and percent of the overrun are not included in this table because public disclosure of the estimates could jeopardize future contract negotiations.

c. DoD counts these modifications of the B-52 as two systems.

TABLE 12. CONTRACTS THAT ARE EXPECTED TO UNDERRUN THEIR TARGET PRICES

| Program | Number of Contracts | Percent Under Target Prices a/ | Total Amount of Underrun (millions of dollars) |
|---|---|---|---|
| Army | | | |
| CH-47D Helicopter | 3 | b/ | b/ |
| Patriot Missile | 1 | b/ | b/ |
| Navy | | | |
| CAPTOR Torpedo | 4 | 1-4 | 8 |
| Close-In Weapon System | 2 | 2-3 | 12 |
| FFG-7 Frigate | 4 | b/ | b/ |
| LSD-41 Landing Ship1 | 4 | 13 | |
| SSN-688 Submarine | 2 | 1-2 | 16 |
| Tomahawk Missile | 1 | 3 | 5 |
| Air Force | | | |
| ALCM Missile | 3 | 1 | 5 |
| B-1B Aircraft | 1 | 2 | 2 |
| B-52 OAS/CMI Modifications | 1 | 6 | 39 |
| E-3A Aircraft | 1 | 4 | 28 |
| GLCM Missile | 1 | 3 | 5 |

SOURCE: Compiled by CBO from the December 31, 1983, SARs.

a. Percent range is for multiple contracts.

b. The amount and percent of the underrun are not included in this table because public disclosure of the estimates could jeopardize future contract negotiations.

about $210 million. Five other systems report underruns totaling about $42 million. According to DoD estimates, the net result would be an overrun of about $2.8 billion or 1 percent of the current program estimates. There is no way to be sure that these overruns are reflected in the total costs discussed in Chapter I, which are the program managers' best estimates of contract status.

The December 1982 SARs contained 36 systems with potential contract overruns of about $4 billion. Twenty-six systems reported overruns in both years, although the number and the mix of contracts changed over the year. Seven systems reported potential underruns in both the December 1982 and December 1983 SARs.

Those are small amounts relative to the total number of contracts and estimated costs for SAR programs. Each of the contracts in Tables 11 and 12 is, however, among the six largest for its respective program; many of them are development and early production contracts. Even though the dollar amount of the cost growth is generally small, overruns on such contracts could be a warning of potential cost growth in future production contracts.

## CHAPTER III. COMPLETENESS AND ACCURACY OF THE SARS

In this chapter, CBO evaluates the accuracy and completeness of the cost and program data presented in the SARs. The five topics discussed are: offsets to meet control totals, exclusion of costs from individual SAR estimates, conflicting weapons delivery plans, SAR improvements, and the lack of SARs for many major weapons systems. In its previous reviews of SARs, CBO also discussed the inconsistent application of inflation rates, but only one instance of this--the AV-8B aircraft system--occurred in the December 1983 SARs.

### OFFSETS TO MEET CONTROL TOTALS

The SARs for 22 systems cited an estimating change that increased or decreased program costs, in order to "offset the new economic indices." Altogether, $1.1 billion in net adjustments were made to eight Army, ten Navy, and four Air Force systems (see Table 13). For example, the SAR estimates for the LHD Amphibious Assault Ship was decreased by $335 million to take account of lower inflation rates. This reduction was offset, however, by an increase of $335 million to reflect an "offset to ASD(C) indices for 1/84 to maintain controls." In making these adjustments, the ten Navy programs raised their estimates, while the four Air Force programs lowered theirs.

Even though the offsets represent a very small percentage of total program costs, they make the accuracy of the costs presented in the SARs questionable. These adjustments were made because total program costs resulting from the application of the latest economic indexes would not otherwise have equalled amounts reported in the President's budget. In effect, these programs have raised or lowered cost estimates to meet budget control totals that were set by the Office of the Secretary of Defense (OSD). The programs with upward adjustments have now overstated their budget requirements and the programs with downward adjustments have now understated theirs.

### COSTS EXCLUDED FROM INDIVIDUAL SAR ESTIMATES

The SARs are most useful when they accurately describe the total costs of individual systems. Failure to report certain costs clouds measurement of unit costs--important to the Nunn-McCurdy amendment--and

TABLE 13. NET ADJUSTMENTS IN COST ESTIMATES TO OFFSET REVISIONS OF INFLATION INDEXES

| System | Amount Overstated or Understated (-) (In millions of dollars) | Percent of Total Costs |
|---|---|---|
| Army | | |
| AHIP | a/ | a/ |
| Copperhead Projectile | 12.1 | 0.7 |
| DIVAD Gun | -224.0 | -5.3 |
| Hellfire Missile | -36.0 | -1.5 |
| M-1 Tank | -96.6 | -0.5 |
| Multiple Launch Rocket System | a/ | a/ |
| Pershing II Missile | a/ | a/ |
| Stinger | -284.3 | -7.6 |
| Navy | | |
| CG-47 Cruiser | 459.0 | 1.6 |
| CH-53E Helicopter | 63.7 | 1.8 |
| CVN-72/73 Carrier | 118.9 | 1.7 |
| DDG-51 Destroyer | 354.5 | 2.4 |
| FFG-7 Frigate | a/ | a/ |
| Landing Craft Air Cushion | 109.1 | 5.4 |
| LHD Assault Ship | 335.0 | 5.6 |
| LSD-41 Landing Ship | 337.7 | 10.2 |
| Sidewinder Missile | 24.3 | 3.3 |
| SSN-688 Submarine | a/ | a/ |
| Air Force | | |
| AMRAAM Missile | -10.9 | -0.1 |
| Sidewinder Missile | -2.0 | b/ |
| Sparrow Missile | -2.9 | b/ |
| C-5B Aircraft | -22.4 | b/ |
| Total | 1,135.2 | 1.0 |

SOURCE: Compiled by CBO from data in the December 1983 SARs.

a. DoD reported an adjustment to the 1984 program due to revised inflation indices. The amount was unspecified.
b. Less than one-half of one percent.

comparisons of total costs between periods. This section describes the major deficiencies in the completeness of the December 1983 SARs.

The SAR cost estimates for 17 systems exclude at least $23.4 billion in program costs that are footnoted in the SARs or reported in other defense budget documents, such as Congressional Data Sheets (see Table 14). Because these costs relate to the item being procured, they should be included in the SAR estimates. Inclusion of these costs would raise the December 1983 estimated costs for the 17 systems by about 8 percent. Of the 17 systems, 3 were Air Force programs, 11 were Navy programs, and 3 were Army programs. For the MX Missile program, for example, the Air Force did not report almost $5 billion of funds authorized for development prior to fiscal year 1983. The Navy did not report over $3 billion of missile procurement and military construction for backfitting Poseidon submarines with the Trident I missile. The Navy also did not include nearly $1 billion of SSN-688 procurement costs for advance procurement funds in 1988-1989 for later ships.

## INCONSISTENT DELIVERY DATA

In past SAR reviews, CBO made extensive use of reported weapons delivery plans as an indication of contract schedule performance. As noted in Chapter II, these delivery plans are not always met.

Because DoD no longer requires program managers to report their planned deliveries for the four quarters after the current SAR, CBO has begun to make greater use of information on delivery plans in Congressional Data Sheets (CDS) which are provided to the Congress in support of the President's annual budget submission. 1/ Actual equipment deliveries contained in the December SARs do not always agree with those contained in the CDS, although both documents are supposed to reflect the most recent President's Budget. Table 15 shows the differences in actual deliveries for 17 systems that are found when the December 1983 SARs and February 1984 CDS are compared. For these systems, either the SAR or the CDS contains inaccurate information about actual deliveries so that it is difficult to draw conclusions as to weapons availability and contract delivery performance. These differences occur for a variety of reasons including typographical errors, use of planning data, and different delivery definitions. Whatever the explanation, the end result is that budgeting decisions are made more

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1. The Congressional Data Sheets are formal budget justification materials submitted each year by the Defense Department to the Congress.

TABLE 14. PROGRAM COSTS EXCLUDED FROM THE DECEMBER 1983 SARS (In millions of dollars)

| System | Primary Cost Category | Costs Excluded |
|---|---|---|
| Army | | |
| Fighting Vehicle | Training devices, ammunition, and product improvements | 994.5 |
| M-1 Tank | Production base support, development of 120 mm gun and ammunition, and development of 105 mm gun and ammunition enhancements | 1,787.4 |
| Patriot Missile | Software and spares costs | 167.5 |
| Subtotal | | 2,949.4 |
| Navy | | |
| TACTAS Sonar | Retrofit and trainer installations | 159.5 |
| CAPTOR Torpedo | MK-46 Torpedoes | 540.0 |
| Trident I Submarine | Development for operational forces | 617.1 |
| Trident I Missile | Trident I backfit program for Poseidon submarines | 3,572.5 |
| Trident II Submarine | Advance procurement in 1988 and 1989 for later ships, and unspecified military construction | 1,777.3 |
| Trident II Missile | Backfit of Trident II missiles into Trident I submarines, unspecified military construction, and ballistic missile defense penetration systems | 2,710.1 |
| LCAC Landing Craft | Advanced procurement in 1989 and 1990 for later ships | 36.7 |
| SSN-688 Submarine | Advance procurement in 1988 and 1989 for later ships | 980.9 |
| CG-47 Cruiser | Combat system engineering development program and AEGIS weapons systems development | 926.0 |
| LHD Assault Ship | Advance procurement in 1989 and 1990 for later ship | 147.0 |
| DDG-51 Destroyer | Advance procurement in 1989 for 1990 ships, and miscellaneous development costs | 443.5 |
| Subtotal | | 11,910.6 |
| Air Force | | |
| F-15/F-16 Derivative Aircraft | Total estimated cost for the derivative fighter budget program element reported by DoD in the FY 1985 Congressional Data Sheets | 3,324.6 |
| B-1B Aircraft | Simulators, military construction, facility improvements/"Tech Mod," and component improvement program | 469.7 |
| MX Missile | Development and military construction funds authorized prior to 1983, and unspecified planing and design funds | 4,713.9 |
| Subtotal | | 8,508.2 |
| Total | | 23,368.2 |

SOURCE: Compiled by CBO from data provided by DoD.

TABLE 15. DIFFERENCES IN ACTUAL DELIVERIES AS GIVEN IN THE DECEMBER 1983 SARS AND THE FEBRUARY 1984 CONGRESSIONAL DATA SHEETS
(In units delivered as of December 31, 1983)

| Weapons System | December 1983 SARs | February 1984 Congressional Data Sheets | Difference |
|---|---|---|---|
| Army | | | |
| Multiple Launch Rocket System | 3,714 a/ | 4,578 | -864 |
| Pershing II Missile | 13 a/ | 17 | -4 |
| Stinger Missile | 5,379 a/ | 5,359 | 20 |
| DIVAD Gun | 0 a/ | 7 | -7 |
| Fighting Vehicle System (FVS) | 855 a/ | 884 | -29 |
| Hellfire Missile | 0 a/ | 39 | -39 |
| Navy | | | |
| Harpoon Missile | 1,628 b/ | 1,590 b/ | 38 |
| Light Armored Vehicle | 5 c/ | 8 | -3 |
| Tomahawk Cruise Missile | 42 a/ | 48 | -6 |
| Trident I Missile | 387 | 408 a/ | -21 |
| Air Force | | | |
| ALCM Missile | 817 a/ | 827 | -10 |
| F-15 Aircraft | 704 a/ | 717 | -13 |
| F-16 Aircraft | 673 a/ | 682 | -9 |
| IIR Maverick Missile | 8 a/ | 3 | 5 |
| Sidewinder Missile | 1,727 a/ | 353 | 1,374 |
| Sparrow Missile | 1,017 a/ | 402 | 615 |
| MX Missile | 0 | 1 d/ | -1 |

SOURCE: Compiled by CBO from data provided by the Department of Defense.

NOTES: The criteria for selecting systems to include in this table were: (1) a delivered quantity greater than zero; and (2) the existence of a Congressional data sheet that was comparable to the system included in the December 1983 SARs.

Reasons for differences in reported deliveries are shown in footnotes below.

a. Actual delivery figure.
b. Different definitions of what a delivered unit consists of.
c. No explanation for the difference.
d. Typographical error.

difficult. Eight of these systems were among the 13 that had SAR/CDS delivery data differences for the period ending December 31, 1982, as reported in CBO's review of the December 1982 SARs.

## SAR IMPROVEMENTS

During its review of the December 1983 SARs, CBO found several ways of improving the quality of the data included in the SARs. This section summarizes these changes, which are generally based on the findings included in the report.

- All acquisition costs related to a weapons system should be included in the SAR estimates;

- Operating and Support (O&S) cost estimates for planned systems as well as for their antecedent systems should be included in the SARs. Inclusion of these costs would allow comparisons of O&S estimates for planned systems with their predecessors. It would also make possible a total life-cycle cost estimate for each system so that the Congress could see not only the estimated purchase price but also the estimated costs of ownership;

- Cost estimates should be updated to reflect the current most likely cost regardless of the annual budget submission. For example, the Administration revised its budget in May 1984, but the total program impact of the revisions will probably not be included in the SARs until the December 1984 SARs are submitted to the Congress in February or March 1985;

- Information on contract cost performance should include percentage completion data as well as the percent and dollar value of cost and schedule variances. Currently the SARs only identify the dollar value of cost and schedule variances;

- Contract cost information for large programs such as the MX missile and Trident submarine and missile programs should be expanded to include more than just the six largest (in dollar value) contracts;

- Weapons systems delivery data included in the December SARs systems should be consistent with the annual budget justification materials, or appropriate explanations of the differences should be included;

- The unit of measure for calculating annual procurement unit costs and total program unit costs should be the item that the Congress authorizes each year and that DoD procures each year. Specifically, the unit of measure for the Patriot and Pershing II programs should be missiles, not fire control units or battery sets;

- Weapons delivery data should include the planned deliveries for the next four calendar quarters after the current SAR;

- Total program costs that result from applying current inflation indexes should not be artificially reduced to force the estimates to meet OSD budgetary control totals; and

- Given the comprehensive nature of the December SARs, it would be useful for these reports to summarize the changes reported during the year in addition to those for the October-December quarter.

## LACK OF SARS FOR MANY MAJOR WEAPONS SYSTEMS

As noted in Chapter I, the Department of Defense Authorization Act of 1983 (Public Law 97-252) required that more systems be included in the SARs. The reporting requirement became effective on January 1, 1983. For several reasons the actual number of systems that could be reported in the SARs fluctuates continuously because:

- New systems meet the SAR reporting threshold;

- The procurement process for older systems either ends or the program becomes so stable that further growth in cost is unlikely;

- The Armed Services Committees grant temporary reporting delays or deferrals for some systems; or

- The Armed Services Committees grant permanent reporting exemptions for some systems.

Last year DoD identified 129 systems that met SAR requirements. On May 31, 1984, at least 135 systems met the SAR reporting criteria. Table 16 lists the 11 systems that have been granted deferrals, and Table 17 lists 19 systems for which the Senate and House Armed Services Committees

TABLE 16. PROGRAMS GRANTED DEFERRAL FROM SAR REPORTING BY THE SENATE AND HOUSE ARMED SERVICES COMMITTEES

| Weapons System | Date Initial Report Required |
|---|---|
| Army | |
| Ballistic Missile Defense (BMD) | March 31, 1984 a/ |
| Short-Range Air Defense Command and Control (SHORAD $C^2$) | March 31, 1984 b/ |
| All Source Analysis System (ASAS) | July 31, 1984 |
| Joint Tactical Missile Systems (JTACMS) | July 31, 1984 |
| Division Support Weapon System (DSWS) | July 31, 1984 |
| Anti-Tactical Missile (ATM) | December 31, 1984 |
| Terminal Guided Warhead (MLRS/TOW) | July 31, 1984 |
| Air Force | |
| Advanced Tactical Fighter | December 31, 1984 |
| Combat Identification System | December 31, 1984 |
| Microwave Landing System | December 31, 1984 |
| Space Surveilance Program | December 31, 1984 |

SOURCE: Compiled by CBO from data provided by DoD and the House and Senate Armed Services Committees.

a. The House Armed Services Committee asked DoD to provide preliminary SAR data by this date. DoD interpreted this request to be a one-time activity and no follow-up reports are planned at this time.

b. Although the House Armed Services Committee set March 31, 1984, as a SAR deadline, no SAR was provided as of that date.

have granted waivers (reporting exemptions). 2/ In a letter to the Armed Services Committees on April 30, 1984, DoD requested that three current SAR systems--the EF-111A aircraft, the Trident I missile, and the Trident I

2. A deferral permits delayed reporting of the system in the SARs, while a waiver allows DoD to exclude the system from the SARs.

TABLE 17. PROGRAMS GIVEN EXEMPTIONS FROM SAR REPORTING BY THE SENATE AND HOUSE ARMED SERVICES COMMITTEES BETWEEN DECEMBER 31, 1982, AND DECEMBER 31, 1983

| Weapons System |
|---|
| **Army** |
| Attack Helicopter (AH-1S) |
| Chaparral Missile |
| M88A1 Medium Recovery Vehicle |
| Lightweight Air Defense System (LADS) |
| Utility Helicopter (UH-1) |
| 105 mm Gun FT. Tank Modification (M60-series) |
| 155 mm Self-Propelled Howitzer |
| Joint Interoperability of Tactical Control Systems |
| Laser Weapon |
| Mobile Protected Gun System |
| SATCOM Ground Equipment |
| Tactical ECM Systems |
| **Navy** |
| Integrated Tactical Surveillance System (ITSS) |
| E-2C Aircraft |
| **Air Force** |
| Pave Mover |
| Tanker, Transport, Bomber (TTB) Trainer 1/ |
| Wide-Area Anti-Armor Munition (WAAM) 1/ |
| A-10 Aircraft |
| E-4 Aircraft |

SOURCE: Compiled by CBO from data supplied by DoD.

1. If either program is funded in the President's fiscal year 1985 budget or any subsequent year, then a SAR is required.

submarine--be excluded from future SARs on the basis that no modifications are planned and all units are under contract. The same letter requested temporary waivers for nine systems and permanent waivers for seven

systems. Four of the systems on the temporary waiver list--the Light Helicopter Family (LHX), the Dual Role Fighter (DRF), the Antitactical Missile (ATM), and the Small Intercontinental Ballistic Missile (the so-called Midgetman missile)--are mentioned as potential SARs for the first time in this letter. In addition, there may be other programs that meet or will meet SAR reporting thresholds but that have not yet been identified.

# APPENDIX

## APPENDIX. SUMMARY TABLES OF DECEMBER 1983 SAR PROGRAM CHANGES

This appendix contains three tables summarizing some of the major tables appearing in the text. Table A-1 covers Army programs, Table A-2 Navy programs, and Table A-3 Air Force programs. Thirteen SAR systems do not appear in any of the tables in Appendix A. All of the systems are new SARs as of December 1983--the SINGARS-V Radio System, the A-6E aircraft, the Airborne Self-Protection Jammer (ASPJ), the Anti-Sub Warfare Standoff Weapon (ASW/SOW), the EA-6B aircraft, the Joint Services Advanced Lift aircraft (JVX), the P-3C aircraft, the T-45TS aircraft, the Defense Meteorological Satellite Program (DMSP), the C-17A aircraft, the Enhanced Joint Tactical Data Distribution System (Enhanced JTIDS), the Low Level Laser Bomb Guidance Kit, and the World Wide Military Command and Control System (WWMCCS) Information System.

TABLE A-1. DECEMBER 1983 SAR REVIEW SUMMARY, ARMY (In millions of dollars)

| System | Nunn-McCurdy Amendment Unit-Cost Increases (percent) 1984 Procurement | Total Program | TABLE 8 Cost of Schedule Changes Costs | Savings (-) | TABLE 10 Schedule Performance Major Milestones Ahead | Behind | Delivery Status |
|---|---|---|---|---|---|---|---|
| Patriot Missile | 2.0 | 5.6 | 133.4 | -- | -- | -- | Behind |
| Pershing II Missile | 29.4 a/ | -- | 54.6 | -- | -- | 1 | Behind |
| Hellfire Missile | 4.5 | -4.7 | 18.4 | -- | -- | 1 | Behind |
| Stinger Missile | 13.5 | -1.1 | 47.6 | -- | -- | -- | -- |
| CH-47D Helicopter | -10.2 | 3.7 | 155.1 | -- | -- | -- | Ahead |
| UH-60 Helicopter | -6.6 | -1.0 | -- | -- | -- | -- | -- |
| AH-64 Helicopter | -5.9 | -0.6 | -- | -- | 1 | -- | -- |
| AHIP Helicopter | -3.7 | -3.5 | -- | -- | -- | 1 | -- |
| Fighting Vehicle System | 1.8 | 6.4 | 194.7 | -- | -- | 1 | Behind |
| Light Armored Vehicle | -- | 49.6 | -- | -- | -- | 1 | -- |
| M-1 Tank | -13.0 | -1.6 | -- | -205.1 | -- | -- | -- |
| Copperhead Projectile | -4.9 | -18.4 | -- | -- | -- | -- | -- |
| DIVAD Gun | -6.1 | 1.7 | -- | -- | -- | 1 | Behind |
| Multple Launch Rocket System | 4.5 | 2.5 | -- | -- | -- | -- | Behind |
| Joint Tactical Information Distribution System | -- | -- | -- | -- | 2 | 3 | -- |
| AN/TTC-39 Switching System | -38.4 | -17.6 | -- | -- | -- | -- | Ahead |
| Army Data Distribution System | -- | -- | -- | -- | -- | 2 | -- |
| Aquila Remotely Piloted Vehicle | -- | -- | -- | -- | -- | -- | Behind |
| Tow 2 Missile | -- | -- | -- | -- | -- | -- | Behind |

a. Unit-cost increase based on the number of missiles procured as compared with the number of battery sets procured, as reported by DoD.

TABLE A-1. ARMY (Continued)

| TABLE 11 Contract Overruns | TABLE 12 Contract Underruns | TABLE 13 Offsets to Revised Inflation Indexes | TABLE 14 Costs Excluded From SARs | TABLE 15 Differences in Actual Deliveries Between SARs and 1984 Congressional Data Sheets Units | System |
|---|---|---|---|---|---|
| b/ | b/ | -- | 167.5 | -- | Patriot Missile |
| b/ | -- | c/ | -- | -4 | Pershing II Missile |
| b/ | -- | -36.0 | -- | -39 | Hellfire Missile |
| -- | -- | -284.3 | -- | 20 | Stinger Missile |
| -- | b/ | -- | -- | -- | CH-47D Helicopter |
| -- | -- | -- | -- | -- | UH-60 Helicopter |
| b/ | -- | -- | -- | -- | AH-64 Helicopter |
| b/ | -- | c/ | -- | -- | AHIP Helicopter |
| 3 | -- | -- | 994.5 | -29 | Fighting Vehicle System |
| -- | -- | -- | -- | -- | Light Armored Vehicle |
| b/ | -- | -96.6 | 1,787.4 | -- | M-1 Tank |
| 1 | -- | 12.1 | -- | -- | Copperhead Projectile |
| b/ | -- | -224.0 | -- | -7 | DIVAD Gun |
| b/ | -- | c/ | -- | -864 d/ | Multiple Launch Rocket System |
| -- | -- | -- | -- | -- | Joint Tactical Information Distribution System |
| -- | -- | -- | -- | -- | AN/TTC-39 Switching Station |
| -- | -- | -- | -- | -- | Army Data Distribution System |
| 132 | -- | -- | -- | -- | Aquila Remotely Piloted Vehicle |
| b/ | -- | -- | -- | -- | TOW 2 Missile |

b. According to DoD, disclosure of overrun/underrun could jeopardize negotiations.
c. The amount of the adjustment was not specified.
d. Based on rocket rounds.

TABLE A-2. DECEMBER 1983 SAR REVIEW SUMMARY, NAVY (In millions of dollars)

| System | Nunn-McCurdy Amendment Unit-Cost Increases (percent) 1984 Procurement | Total Program | TABLE 8 Cost of Schedule Changes Costs | Savings (-) | TABLE 10 Schedule Performance Major Milestones Ahead | Behind | Delivery Status |
|---|---|---|---|---|---|---|---|
| F-14 Aircraft | -11.3 | 6.5 | -- | -- | -- | -- | Behind |
| F/A-18 Aircraft | -0.9 | 0.3 | 313.1 | -- | -- | -- | -- |
| AV-8B Aircraft | 2.8 | -1.3 | 852.9 | -- | -- | 1 | Behind |
| LAMPS MK III-Helicopter (SH-60B) | -10.8 | -12.8 | -- | -- | -- | -- | Ahead |
| LAMPS MK III-Ships | -10.5 | -27.5 | 5.6 | -- | -- | -- | -- |
| CH-53E Helicopter | -15.4 | -6.7 | 4.1 | -- | -- | -- | Ahead |
| CAPTOR Torpedo System | -3.6 | 0.9 | -- | -- | -- | -- | Behind |
| AMRAAM Missile | -- | -4.2 | -- | -- | -- | -- | -- |
| HARM Missile | -39.3 | -5.6 | -- | -18.7 | -- | 1 | -- |
| Harpoon Missile | 0.2 | 5.2 | -- | -- | -- | -- | Ahead |
| Phoenix Missile | 2.4 | -4.0 | 2.5 | -- | -- | 4 | Behind |
| Sidewinder Missile | 1.0 | 7.1 | -- | -- | -- | -- | -- |
| Sparrow Missile | -- | 1.3 | a/ | -- | -- | -- | Behind |
| Tomahawk Missile | -9.2 | 13.0 | 418.1 | -- | b/ | 5 | Behind |
| Trident I Missile | -5.2 | -2.7 | -- | -- | -- | -- | Behind |
| Trident I Submarine | -- | -2.1 | -- | -- | -- | -- | -- |
| Trident II Missile | -- | -3.8 | -- | -- | -- | -- | -- |
| Trident II Submarine | -8.7 | -3.5 | -- | -- | -- | -- | -- |
| TACTAS Sonar | 6.3 | 6.9 | 12.9 | -- | -- | -- | -- |
| SSN-688 Submarine | -2.6 | 2.5 | -- | -- | -- | -- | -- |
| CG-47 Cruiser | -12.0 | -5.2 | -- | -- | b/ | -- | -- |
| FFG-7 Frigate | -- | -1.6 | -- | -- | -- | -- | -- |
| CVN Carrier | -- | 1.7 | -- | -- | b/ | -- | -- |
| Battleship Reactivation | -- | 2.2 | 127.9 | -- | 1 b/ | 3 | -- |
| DDG-51 Destroyer | -- | -12.5 | -- | -- | 1 | 1 | -- |
| Joint Tactical Information Distribution System | -- | -- | 55.6 | -- | -- | 10 | -- |
| Light Armored Vehicle | -4.7 | -0.7 | -- | -28.6 | -- | 2 | Behind |
| Landing Craft Air Cushion | -3.0 | 8.6 | 5.1 | -- | -- | -- | -- |
| E-6 Aircraft | -- | 4.6 | -- | -- | b/ | -- | -- |
| MK-50 Torpedo | -- | -- | -- | -- | -- | 1 | Ahead |
| LSD-41 Landing Ship | -1.6 | -18.1 | -- | -- | -- | -- | -- |
| Standard Missile 2 | -- | -- | -- | -- | -- | -- | -- |
| Submarine Advanced Combat System | -- | -- | -- | -- | -- | -- | -- |
| Close-In Weapon System | -- | -- | -- | -- | -- | -- | -- |
| LHD Assault Ship | -1.0 | 1.0 | -- | -- | -- | -- | -- |

a. The cost of this stretchout could not be determined using the SAR information.

b. Major milestones that were to-be-determined (TBD) have been assigned dates or milestones that had dates have been changed to TBD.

TABLE A-2. NAVY (Continued)

| TABLE 11 Contract Overruns | TABLE 12 Contract Underruns | TABLE 13 Offsets to Revised Inflation Indexes | TABLE 14 Costs Excluded From SARs | TABLE 15 Differences in Delivery Schedules Between SARs and 1984 Congressional Data Sheets (Units) | System |
|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | F-14 Aircraft |
| 63 | -- | -- | -- | -- | F/A-18 Aircraft |
| 11 | -- | -- | -- | -- | AV-8B Aircraft |
| c/ d/ | -- | -- | -- | -- | LAMPS MK III-Helicopter (SH-60B) |
| d/ | -- | -- | -- | -- | LAMPS MK III-Ships |
| 5 | -- | 63.7 | -- | -- | CH-53E Helicopter |
| -- | 8 | -- | 540.0 | -- | CAPTOR Torpedo System |
| -- | -- | -- | -- | -- | AMRAAM Missile |
| 8 | -- | -- | -- | -- | HARM Missile |
| -- | -- | -- | -- | 38 | Harpoon Missile |
| -- | -- | -- | -- | -- | Phoenix Missile |
| -- | -- | 24.3 | -- | -- | Sidewinder Missile |
| -- | -- | -- | -- | -- | Sparrow Missile |
| 40 | 5 | -- | -- | -6 | Tomahawk Missile |
| -- | -- | -- | 3,572.5 | -21 | Trident I Missile |
| 287 | -- | -- | 617.1 | -- | Trident I Submarine |
| -- | -- | -- | 2,710.1 | -- | Trident II Missile |
| -- | -- | -- | 1,777.3 | -- | Trident II Submarine |
| 7 | -- | -- | 159.5 | -- | TACTAS Sonar |
| 97 | 16 | e/ | 980.9 | -- | SSN-688 Submarine |
| 36 | -- | 459.0 | 926.0 | -- | CG-47 Cruiser |
| c/ | c/ | e/ | -- | -- | FFG-7 Frigate |
| -- | -- | 118.9 | -- | -- | CVN Carrier |
| 13 | -- | -- | -- | -- | Battleship Reactivation |
| -- | -- | 354.5 | 443.5 | -- | DDG-51 Destroyer |
| -- | -- | -- | -- | -- | Joint Tactical Information Distribution System |
| -- | -- | -- | -- | -3 | Light Armored Vehicle |
| -- | -- | 109.1 | 36.7 | -- | Landing Craft Air Cushion |
| 183 | -- | -- | -- | -- | E-6 Aircraft |
| -- | -- | -- | -- | -- | MK-50 Torpedo |
| 15 | 13 | 337.5 | -- | -- | LSD-41 Landing Ship |
| 3 | -- | -- | -- | -- | Standard Missile 2 |
| 13 | -- | -- | -- | -- | Submarine Advanced Combat System |
| -- | 12 | -- | -- | -- | Close-In Weapon System |
| -- | -- | 335.0 | 147.0 | -- | LHD Assault Ship |

c. According to DoD, disclosure of overrun/underrun could jeopardize negotiations.

d. Contract information applies to both the LAMPS MK III-Helicopter and Ship systems.

e. Exact amount was not given.

TABLE A-3. DECEMBER 1983 SAR REVIEW SUMMARY, AIR FORCE (In millions of dollars)

| System | Nunn-McCurdy Amendment Unit-Cost Increases (percent) 1984 Procurement | Total Program | TABLE 8 Cost of Schedule Changes Costs | Savings (-) | TABLE 10 Schedule Performance Major Milestones Ahead | Behind | Delivery Status |
|---|---|---|---|---|---|---|---|
| F-15 Aircraft | 11.6 | -1.8 | -- | -- | -- | -- | Ahead |
| F-16 Aircraft | -0.6 | -6.2 | -- | -- | -- | -- | Ahead |
| E-3A Aircraft | -- | -5.4 | -- | -- | 1 | -- | -- |
| EF-111A Aircraft | -- | 2.0 | -- | -- | -- | -- | -- |
| KC-135 Reengining Modification | -17.3 | -6.9 | -- | -- | -- | -- | -- |
| B-1B Aircraft | -0.7 | -0.1 | -- | -- | -- | -- | -- |
| B-52 OAS/CMI Modifications | -- | -- | -- | -- | -- | -- | -- |
| HARM Missile | -17.4 | -10.5 | -- | -176.6 | -- | -- | -- |
| IIR Maverick Missile | 13.8 | -1.2 | 139.7 | -- | -- | -- | Ahead |
| AMRAAM Missile | -- | -- | 3.7 | -- | -- | -- | -- |
| Sidewinder Missile | -1.3 | -4.5 | -- | -- | -- | -- | Behind |
| Sparrow Missile | -1.0 | -0.2 | -- | -- | -- | -- | Behind |
| Defense Satellite Communications System | -- | -10.6 | -- | -- | -- | 1 | -- |
| NAVSTAR Global Positioning System | 14.6 | 4.3 | -- | -- | -- | 4 | -- |
| Inertial Upper Stage (IUS) Rocket | -- | 49.9 | -- | -- | -- | 1 | -- |
| ALCM Missile | -- | -8.4 | -- | -- | -- | -- | Ahead |
| GLCM Missile | -4.4 | 3.9 | -- | -- | -- | 2 | a/ |
| Joint Tactical Information Distribution System | -- | -- | -- | -- | 1 | 6 | -- |
| LANTIRN Navigation/ Targeting System | -- | -7.8 | -- | -75.5 | -- | 3 | -- |
| HH-60D Helicopter | -- | 6.9 | 144.7 | -- | -- | 5 | -- |
| MX Missile | 9.4 | -0.8 | 132.9 | -- | -- | -- | -- |
| T-46A Aircraft | -- | -0.3 | 100.7 | -- | -- | 2 | -- |
| OTH-B Radar | -- | -- | -- | -- | -- | -- | -- |
| Defense Support Program | -- | -- | -- | -- | -- | -- | -- |
| KC-10 Aircraft | -2.8 | -5.2 | -- | -- | -- | -- | -- |
| Precision Location Strike System | -- | -- | -- | -- | -- | -- | -- |
| Space Defense System | -- | -- | -- | -- | -- | -- | -- |
| Tri-Tac Communications Program | -- | -- | -- | -- | -- | -- | -- |
| C-5B Aircraft | 3.0 | -1.4 | -- | -- | -- | -- | -- |

a. Program has two or more items for delivery, one of which is ahead of schedule and one behind schedule.

TABLE A-3. AIR FORCE (Continued)

| TABLE 11 Contract Overruns | TABLE 12 Contract Underruns | TABLE 13 Offsets to Revised Inflation Indexes | TABLE 14 Costs Excluded From SARs | TABLE 15 Differences in Delivery Schedules Between SARs and 1984 Congressional Data Sheets (Units) | System |
|---|---|---|---|---|---|
| -- | -- | -- | b/ | -13 | F-15 Aircraft |
| 929 | -- | -- | b/ | -9 | F-16 Aircraft |
| 2 | 28 | -- | -- | -- | E-3A Aircraft |
| -- | -- | -- | -- | -- | EF-111A Aircraft |
| -- | -- | -- | -- | -- | KC-135 Reengining Modification |
| -- | 2 | -- | 469.7 | -- | B-1B Aircraft |
| 11 | 39 | -- | -- | -- | B-52 OAS/CMI Modifications |
| -- | -- | -- | -- | -- | HARM Missile |
| 56 | -- | -- | -- | 5 | IIR Maverick Missile |
| 135 | -- | -10.9 | -- | -- | AMRAAM Missile |
| -- | -- | -2.0 | -- | 1,374 | Sidewinder Missile |
| -- | -- | -2.9 | -- | 615 | Sparrow Missile |
| -- | -- | -- | -- | -- | Defense Satellite Communications System |
| 50 | -- | -- | -- | -- | NAVSTAR Global Positioning System |
| 118 | -- | -- | -- | -- | Inertial Upper Stage (IUS) Rocket |
| -- | 5 | -- | -- | -10 | ALCM Missile |
| 19 | 5 | -- | -- | -- | GLCM Missile |
| -- | -- | -- | -- | -- | Joint Tactical Information Distribution System |
| -- | -- | -- | -- | -- | LANTIRN Navigation/ Targeting System |
| -- | -- | -- | -- | -- | HH-60D Helicopter |
| 58 | -- | -- | 4,713.9 | -1 | MX Missile |
| 36 | -- | -- | -- | -- | T-46A Aircraft |
| 4 | -- | -- | -- | -- | OTH-B Radar |
| 22 | -- | -- | -- | -- | Defense Support Program |
| 127 | -- | -- | -- | -- | KC-10 Aircraft |
| 59 | -- | -- | -- | -- | Precision Location Strike System |
| 109 | -- | -- | -- | -- | Space Defense System |
| 19 | -- | -- | -- | -- | Tri-Tac Communications Program |
| -- | -- | -22.4 | -- | -- | C-5B Aircraft |

b. An additional $3,324.6 that has been budgeted for an F-15/F-16 derivative aircraft is not shown.